

# PATENT SPECIFICATION

984.038



DRAWINGS ATTACHED

984.038

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## COMPLETE SPECIFICATION

### Improvements relating to the Combining of Continuous Webs Together

I, DENNIS KILLEN, a British subject of 57 St. Simon Street, Salford 3, Lancashire, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to the combining of continuous webs together face to face to form a laminate. A particular use of the invention is in the combining of a synthetic foam web to a textile fabric or other web. In the case of a synthetic foam the adhesion derives from a plasticising of the surface of the foam itself as described below, the foam being of a thermoplastic nature but, in the combining together of non-plasticising webs, such as two textile fabrics, one or both would need to be provided with a thermoplastic adhesive before being treated according to this invention.

According to this invention the web which is to be made adhesive is passed through a micro-wave resonator where it becomes heated sufficiently to plasticise the surface (either the surface of the web itself in the case of foam, or the applied surface adhesive in other cases) whereafter the webs to be laminated are pressed together for example by being passed through a roller nip or under air jets or other pressure means.

The invention includes cases where the webs are brought together before heating and are passed through the heating zone whilst in contact with each other, as well as cases where the web whose surface is to be made adhesive is passed alone through the heating zone and then brought into contact with the other web immediately. The former alternative is preferred.

The invention is not limited to the combining of only two webs but can be applied equally successfully to the simultaneous combining of more than two webs, for example in [Price 4s. 6d.]

combining a textile fabric to each face of a web of foam.

According to another feature of the invention, the temperature to which the thermoplastic material or thermoplastic adhesive becomes raised in the micro-wave heating zone is regulated by the provision on the surface of the material of substances of a different dielectric co-efficient, whereby the heat energy available in the material is modified. One such substance useful for this purpose is iron filings. These would be spread on the surface in regulated amounts.

The invention will now be described with reference to the accompanying drawing the single Figure of which is a schematic layout of a machine for uniting two webs together according to the first of the two alternatives mentioned above, namely where both webs pass through the heating zone before being pressed together.

In the drawing a web of foam 1 from a batch 2 is to be combined with a web of fabric or other material 3 from a batch 4. The webs are led over and under guide rolls 5, from whence they pass through a resonator cavity 6 with which are associated a micro-wave power unit 7 and a wave guide 8. From the resonator the two webs pass through the nip of a pair of press rolls 9, and the combined webs are bunched up at 10.

If a potentially adhesive substance is to be applied to one web, this may be done for example by spraying as indicated at 11.

Any known driving means may be adopted for feeding the webs through the machine. Also any known temperature control means for the resonator 6 and any known pressure adjusting means for the rolls 9 may be adopted.

#### WHAT I CLAIM IS:—

1. A method of laminating together two webs of material one of which has a thermo-

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- plastic surface, wherein said one web is passed through a micro-wave resonator where it becomes heated sufficiently to plasticise the surface, whereafter the webs to be laminated are pressed together to cause them to unite. 6. The method of any preceding claim, applied to the simultaneous lamination of more than two webs. 25
- 5 2. The method of claim 1, wherein the web itself is of thermoplastic material and the surface of the web itself is plasticised in said resonator. 7. The method of any of claims 1-6 wherein the temperature to which the thermoplastic surface of said one web becomes raised in the micro-wave heating zone is regulated by the provision on the surface of the material of substances of a different dielectric co-efficient, whereby the heat energy available in the material is modified. 30
- 10 3. The method of claim 1, wherein said thermoplastic surface is a thermoplastic adhesive applied to the surface of a web before its passage through the resonator and is plasticised whilst in the resonator. 8. The method of claim 7, wherein said provided substance is iron filings. 35
- 15 4. The method of claim 1, 2 or 3, wherein the webs are brought together before heating and are passed through the heating zone whilst in contact with each other. 9. The method of claim 1, when carried out substantially as herein set forth. 40
- 20 5. The method of claim 1, 2 or 3, wherein the web whose surface is to be made adhesive is passed alone through the heating zone and then brought into contact with the other web immediately. 10. Laminated webs whose lamination has been effected by a method as herein claimed.

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1 SHEET

This drawing is a reproduction of  
the Original on a reduced scale.

